

What is claimed is:

1. A near-field optical head comprising:

a distributed feedback laser including first and second cladding layers, an active layer sandwiched between said first and second cladding layers, a first reflecting member having a periodic wave-shaped structure formed within said first cladding layer at an interface between said active layer and said first cladding layer or in close proximity to said active layer, a second reflecting member provided on a first end surface of an assembly of said first and second cladding layer and active layer and having an exit window formed by a fine aperture, a third reflecting member provided on a second end surface of said assembly, and first and second current injection electrodes electrically connected to said first and second cladding layers, respectively; and

an injection current source connected to said first and second current injection electrodes;

whereby laser light emitted from said exit window of the distributed feedback laser is made incident upon an optical record medium arranged in a near-field.

2. The near-field optical head according to claim 1, wherein said periodic wave-shaped structure of the first reflecting member has a smooth wave configuration.

3. The near-field optical head according to claim 1, wherein said second reflecting member includes a dielectric film provided on the first end surface of the assembly of the first and second cladding layers and active layer, and a metal film formed on the dielectric film and having formed therein said fine aperture constituting said exit window.

4. The near-field optical head according to claim 1, wherein said third reflecting member is formed by multiple dielectric films.

5. The near-field optical head according to claim 1, wherein the near-field optical head is constructed as a recording optical head for recording information on an optical record medium.

6. The near-field optical head according to claim 5, wherein a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium.

7. The near-field optical head according to claim 1, wherein the near-field optical head is constructed as a reproducing optical head for reproducing information recorded on the optical record medium.

8. The near-field optical head according to claim 7, wherein a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity, the thus produced near-field laser light is made incident upon the optical record medium through said exit window, laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium.

9. The near-field optical head according to claim 7, wherein a

constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity, the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, and laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein; whereby the near-field optical head further comprises a photodetector for receiving laser light emanating from said third reflecting member to produce a reproduction signal representing the information recorded on the optical record medium.

10. The near-field optical head according to claim 1, wherein the near-field optical head is constructed as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium.

11. The near-field optical head according to claim 10, wherein upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium; and

upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity, the thus produced near-field laser

light is made incident upon the optical record medium through said exit window, laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium.

12. The near-field optical head according to claim 10, wherein the near-field optical head further comprises a photodetector; and

upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium; and

upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity, the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein, and laser light emanating from said third reflecting member is detected by said photodetector to produce a reproduction signal representing the information recorded on the optical record medium.